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## NOTES AND COMMENTS.

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### STORM TRACKS.

THE laws of Nature reveal themselves most clearly in the extremes of their manifestations; and the almost unparalleled recent series of tornadoes elucidates a principle which a few years ago was vaguely pointed out in Professor Grety's remarks on a meteorological phenomenon of the southern Alps.

"Whenever the highlands of Tessino and Savoy are invaded by exceptionally heavy snow falls," he says in a monograph founded on the observations of many years, "the mountaineers look for an early visit of the *Foehn-storm*, the warm south-wind from the Mediterranean, that anticipates the work of the summer sun, and often melts away massive snowbanks in forty-eight hours. That expectation is rarely disappointed. The *Foehn* comes like a prompt answer to the prayers of the snowbound highlanders, and it almost seems as if Nature, in the very act of sending afflictions, contrived to prepare the proper remedy, for the recurrence of the phenomenon is too frequent to doubt the fact that the snow-fields somehow attract the warm sea-wind."

The fact of the coincidence is confirmed by the weather records of half a century, but the suggested explanation is even more unsatisfactory than the ingeniously absurd attempt to account for the frequent alternation of warm and cold years. Severe winters, according to that hypothesis, seal up the outlets of the Arctic seas and thus prevent the icebergs from starting on their southward exodus. Dry, hot summers follow and release the imprisoned air-chillers, which drift equatorward in whole sierras, and naturally treat the summer tourists to a reverse of last year's experience. The originator of that theory may not have overrated the influence of floating ice hills, but overlooked the circumstance that cold winters tend to congeal the waters of the lower latitude and thus prepare abundant consignments of drift ice from less distant sources of supply.

Alpine snow-banks, a dozen feet thick, melt away in early spring with a suddenness that must be seen to be credited, but the *rationale* of their "attraction" for the warm south wind is a little too exclusively teleological. Nearly a century ago the traveler Burkhardt came nearer the true explanation in noticing the frequent reversion of the seastorms that sweep in spring over the plains of the Arabian peninsula. The *tramontana*, as the Italians call the cold wind from the other side of the Alps, is a continuation of the northwest gales that cross the Atlantic in winter and make themselves felt as far south as Cairo and Damascus, fringing the mountain brooks of the Lebanon with icicles, and driving the friars of Mount Sinai to the shelter of their cavern-cells. In cold winters they even invade Arabia,

improving the drinking water of Mecca, and crossing the tableland haunts of the pious Wahabees, but meet their match in the plains of Arabia Deserta. In the Wad-el-Akhaff, or "Sea of Shifting Sands," the intruders from the northwest provoke the fury of counter-currents that not only resist their further progress, but chase them back, all the way across the Mediterranean, over the crests of the Apennines and into the highland glens of the Maritime Alps.

"There comes the *Foehn*," says the highlander, who hears the moaning of the nightwind in the swaying pines; "I did expect that last heavy snow would change the weather."

He instinctively recognizes a causal connection between the two phenomena, though he probably remembers that the last snowfall was attended with violent northwest gales. Less heavy storms from the same direction might mingle with the breezes of the Mediterranean, or spend their force on the ramparts of the Atlas Range; but this last *tramontana* tried to carry its conquests further and awakened the wrath of a counterblast. On the same principle an earthquake shock, after hurling back the waters of the ocean, evokes a reflux wave like that which overwhelmed Lisbon in 1755, and the seaports of Peru in 1823. Compressed steam recoils with force sufficient to turn the wheels of the heaviest machinery, and the pressure of conflicting air-currents initiates the rotary storms known as tornadoes or cyclones. The violence of such storms is proportioned to the degree of atmospheric resistance, for the same reason that powder, ignited in light package, merely flares up, but explodes with destructive force against an unyielding obstacle.

In the Indian Ocean, where trespass-freaks of the trade-winds encounter the expanding atmospheric strata of heated coast plains, the typhoon often rages with a fury "as if heaven and earth were going to return to their original chaos," and the recent monster gales, too, may be ascribed to a reaction against an excess of persistent air-currents.

The preceding six months had been abnormally warm. Since 1847 our Western and Middle States had not experienced anything like a similar mild winter. In the river counties of Kentucky, from Louisville down, the weather remained so warm that Indian summer and spring might be said to have met. In some of the Tennessee mountain districts black cattle were left to shift for themselves, and, in fact, found many too much better things to touch hay. Swarms of robins from the Yankee States went as far south as Alabama and there stopped to enjoy all the comforts of the Mexican tropics; squirrels exhausted their winter store before the middle of January, and had to return to their scraping grounds, like the California miners to the "tailings" of '49; birch trees put forth new leaves; children sent to the hills to replenish the salt-logs returned with bunches of violets; the old inhabitants did not know what to make of it and would not risk a prediction, for the prophetic groundhog, too, had refused to be stabled.

Here and there professional weather-augurs, indeed, expressed a misgiving that the strange winter would be followed by a queer spring, but the fulfillment of that prophecy came in a rather unexpected manner.

"Bluebells at Christmas, sleighbells at Easter,"

—but Easter Sunday was ushered in by mid-summer-night dreams. The growlers who had protested against the mild winter had real cause to complain of the hot spring. All through Kentucky, Indiana, Illinois, Missouri, and Kansas, April was a summer month. In the Southern Alleghanies the

slumbering wood-nymphs awakened at least six weeks ahead of date; and on a trip from Lexington to Chattanooga I saw the foliage, flowers, and berries advanced before the end of April to the June status of ordinary years. The strawberry planters of Eastern Virginia had a splendid crop, but their prestige for once did not avail them against their inland competitors. Early berry-weather had prevailed from Cape Hatteras to the valley of the upper Missouri.

And throughout that precocious summer, south and southeast winds prevailed against the usual westerly gales. Tentative changes of programme were followed by a swift relapse. Twice in March and once in April the wind veered to the northwest, but the expected "three days' norther" was nipped in the bud before it could do any nipping of its own. Like a well entrenched conqueror the East American sirocco defied revolts. Its "sphere of influence," as the African land-grabbers would express it, extended further and further West, and might have held its own till the arrival of reinforcements from the throne of the summer-solstice, if in the plenitude of its power it had not undertaken to measure its strength against the barbarians of the far north. About the middle of May air-waves of a semi-tropical temperature invaded Canada, and frightened the grain-farmers of the Red River Valley with the prospect of a severe drought, but caught a Tartar on the shores of Lake Winnipeg. The great woodland of the Northwest evolved areas of cool air that resisted coercion, and finally exploded upon the intruder with an energy that reversed the atmospheric currents of the whole Mississippi Valley, as far as Arkansas and northern Texas.

There, in the valley of another Red River, the defeated sirocco made a stand, and on the evening of May 15 burst upon the city of Sherman, Tex., and across the river into the plains of Indian Territory, as if it had tried to regain the lost ground by a single mighty effort. In Grayson County (Sherman) alone 120 persons were killed outright; the towns of Howe, Denton, Gribble Springs, and Justin were almost blown off the face of the earth, and the storm ended with torrents of rain that buried the ruins under hillocks of driftwood. Capt. W. S. Bostwick, of Sherman, describes the force of the first storm-blasts as equal to that of an avalanche. "A moment after I heard the rush of the whirlwind," he says, "I saw Mr. Berger's house blown into the air, and then Mr. Shearer's house. Trees and big timbers were whirled by like dry twigs, and just as I called to my folks to run for life, I felt our own walls shake. Then came an awful crash and a sense of suffocation, our house was gone, and myself and family were scattered about the yard under the débris."

Yet that fearful storm was far surpassed by the tornado which a few days after confirmed the repulse of the southern air-currents.

The afternoon of Wednesday, May 27th, had been unusually warm all through eastern Missouri. At 4 P. M. a thermometer in the shade of a leafy porch on the Old Manchester Road, St. Louis, rose to 96 degrees Fahrenheit, but gradually fell to 92 degrees, when the sun was blotted out by a dark cloud rising over Forest Park, in the west. Towards that cloud a brisk southeast wind suddenly set in, and thus started the great battle of the storm giants. Warmed by its contact with the atmosphere of the sweltering city, the southeast breeze rose, leaving a vacuum through which the pent-up air-strata in the northwest rushed in as through a floodgate. Cottages, trees, and lumber piles came whirling through the air like chaff, and the next minute the roar of the tornado mingled with the crash of larger buildings

and the fearful shrieks of panic-stricken fugitives. "Don't come near that wall—it's giving way!" yelled an overseer when a swarm of fugitives made a dash for the shelter of a westside factory—"down, quick; fling yourselves down flat and clutch the grass!" But even that expedient failed of its purpose, and many prostrate refugees were torn up and whirled away like paper dolls. A sailor of the steamer "D. H. Pike" grappled the railing of the hatchway, but the cyclone broke his grip and saved his life by flinging him overboard, for ten minutes after the steamer came drifting down the river, bottom up. Twenty-six other vessels were utterly demolished; the river resembled a pool choked with the drift of a swollen mountain-torrent. In East St. Louis houses of two and three stories were blown down in rows; smaller buildings were scattered like card-houses, especially in the suburbs, where the storm was not checked by the barrier of massive blocks, and had things all its own way.

The fearful destructiveness of its full-sweep blasts may be inferred from the fact that they rent the solid masonry of the Eads Bridge—masonry designed to resist floods and drift-ice—and almost choked the shore-channels with rock avalanches. Where the cement had resisted demolition, the blocks of hard stone had been broken off as if by hammer-strokes. Four trains, together with the fragments of trucks and express wagons were piled up in front of the Vandalia freight depot; and in the two cities at least four hundred persons were killed on the spot.

Destructive storms also raged in Oklahoma, Iowa, Southern Illinois, Michigan, Kentucky, and Alabama, involving a loss of many millions and of an aggregate of at least a thousand human lives.

With few exceptions, the direction of these gales was either from north to south, or from west to east, thus revealing their ultimate cause as a reaction against the abnormally continued southeast winds of the preceding six or seven months. Two other remarkable analogies have been also noticed in the circumstance that five of the six most violent storms were preceded by oppressively warm weather, and that their proximate cause—their local provocation, as it were—was a gust of wind from a southeasterly direction. Four times they developed their main force in crossing a broad river valley.

F. L. OSWALD.

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#### A PRESIDENT OF NO IMPORTANCE.

It is often a source of surprise to travelers in Switzerland, to find that even Swiss people of more than ordinary intelligence do not seem to know, or to care, who may be their President at any particular time.

Such indifference seems incredible to Americans, because they have not learned that the Swiss political system is the least personal in the world; that its nominal head is, indeed, a President of no importance.

The truth is, the constitution of Switzerland does not intrust the executive power of the government to one man, but to a Federal Council of seven members, acting as a sort of Board of Administration. These seven men are elected for a term of three years by the two legislative houses, composing the Federal Assembly, united in joint session. Any Swiss citizen, except a clergyman, is eligible to the Federal Council, but not more than one member can be chosen from the same Canton. Vacancies are filled at the first ensuing session of the Federal Assembly, for the remainder of the term of office.